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## (54) BULKY SHEET

### (57)Abstract:

PURPOSE: To obtain a bulky sheet suitable for cleansing articles and cushioning materials in sanitary goods excellent in dirt absorbing and retaining ability by unitedly interlacing a non-woven fabric assembly onto one or both side of a netlike sheet, forming uneven parts and subjecting to carry chemicals.

CONSTITUTION: A non-woven fabric like fiber assembly containing 1-99wt.%, preferably 5-95wt.% or more preferably 10-90wt.% hydrophilic fibers such as pulp, cotton or hydrophilic synthetic fibers, etc., is laminated on one or both side of a heat shrinkable and netlike sheet, and then subjected to water needling to interlace and unite component fibers. After drying and heat shrinking to form uneven part on the surface, 0.1-500wt.% chemicals such as oils or detergents, etc., such as mineral oils, synthetic oils, surfactants, etc., based on the weight of the above mentioned fiber assembly are carried on the sheet by spraying.

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**CLAIMS**

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**[Claim(s)]**

[Claim 1] The loft sheet characterized by for the configuration fiber of the fiber aggregate which the fiber aggregate of the shape of a nonwoven fabric formed by interlacement of fiber is united with one side or both sides of a reticulated sheet in the state of interlacement also to this reticulated sheet with interlacement between the configuration fiber, and much concave heights are formed in the front face of the above-mentioned fiber aggregate, and is interlaced by at least one side of the above-mentioned reticulated sheet to contain hydrophilic fiber.

[Claim 2] The loft sheet according to claim 1 characterized by the configuration fiber of the above-mentioned fiber aggregate currently interlaced by at least one side of the above-mentioned reticulated sheet containing hydrophilic fiber one to 99% of the weight.

[Claim 3] The loft sheet according to claim 1 or 2 characterized by carrying out support of the drugs 0.1 to 500% of the weight (fiber aggregate weight criteria) at the above-mentioned fiber aggregate.

[Claim 4] It is the loft sheet according to claim 1, 2, or 3 characterized by for the above-mentioned reticulated sheet being a heat shrink nature sheet, and forming much concave heights on the front face of the heat shrink by heat treatment of the above-mentioned reticulated sheet, as for the above-mentioned fiber aggregate.

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**[Translation done.]**

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## DETAILED DESCRIPTION

### [Detailed Description of the Invention]

#### [0001]

[Industrial Application] This invention relates to the loft sheet used for facing or a cushioning material in the loft sheet with which the front face of a sheet forms the shape of toothing, the goods for cleaning especially business-use or for home use (sheet for cleaning), toilet material, and sanitary goods etc.

#### [0002]

[Description of the Prior Art] The dustcloth which is wet or the dry-type wiping cloth for cleaning which uses textile fabrics or a nonwoven fabric as a base as goods for cleaning (sheet for cleaning), for example, There are some which use the formal thing which bundled the thing of the shape of the chemistry dustcloth which infiltrated oil into the plane textile fabrics or nonwoven fabric, or yarn represented by the mop in the state of [ dry-type ] wet, and these goods for cleaning are widely used at a home, an office, a store, a building, works, etc. according to the purpose.

[0003] Although what infiltrated oil into the plane textile fabrics and nonwoven fabric like the above was common as for the chemistry dustcloth which is the conventional goods for cleaning, the dust-collecting ability which adsorbs the dirt on a cleaned field and is removed, \*\*\*\*\* holding the dirt which took, and a cleaning side getting damaged, and using a more flexible and bulky nonwoven fabric as an ingredient of the goods for cleaning for high-performance-izing of tightness etc. is proposed.

[0004] What uses elasticity or crimp nature fiber for all or a part of fiber which constitutes a nonwoven fabric like the thing which the thing and JP,2-124122,A which carry out post processing, such as a stitch, to JP,64-61546,A after general nonwoven fabric formation like a publication as the approach of bulky-izing of the nonwoven fabric as goods for cleaning are made to nap like a publication and JP,2-160962,A, and a JP,2-191422,A publication is raised.

[0005] Moreover, development of a loft nonwoven fabric is performed in the application like JP,1-164312,A also about the facing of not only the goods for cleaning but a cushioning material, wrapping, or sanitary goods.

#### [0006]

[Problem(s) to be Solved by the Invention] However, \*\* et al. and the loft nonwoven fabric mentioned above are holding the following technical problems. In bulky-izing by post processing of a common nonwoven fabric, or bulky-ization by piloerection If a lot of nonwoven fabrics and fiber raw materials must be used and it cleans by once putting a pressure for the manifestation of bulky-izing Since the nonwoven fabric and fiber of a inner layer which the contact surface with a cleaned field will be fixed and constitute the thickness of the appearance of the nonwoven fabric as cleaning goods cannot contact a cleaned field, they are inefficient-like [ the availability of the nonwoven fabric which is a base ].

[0007] Moreover, although the adsorption capacity and maintenance ability of dirt, such as dust with the fine method of producing the irregularity of a loft using the elasticity of fiber itself and crimp nature, improve compared with a common plane nonwoven fabric, the concave convexity of sufficient like for capture of big dirt, such as bread crumbs using the concave convexity of a

nonwoven fabric, is not obtained.

[0008] Moreover, when oil is infiltrated into this nonwoven fabric, it is sticky in the case where oil is infiltrated into a common plane nonwoven fabric, and an EQC, easy to give admiration, and easy to give a user displeasure.

[0009] Adhesion and joining are performed at the time of the unification of a film etc. and a nonwoven fabric whose bulky-ization of the cushioning material using a nonwoven fabric has bulky grant nature, and the degree of freedom of nonwoven fabric fiber is falling remarkably. Generally, although the nonwoven fabric as cleaning goods tends to strengthen junction of fiber so that fiber waste may be taken out or it may not be torn at the time of cleaning, the fall of the degree of freedom of nonwoven fabric fiber has the problem which decreases uptake ability, such as hair of the cotton dust brought about according to the debt effectiveness of nonwoven fabric fiber, waste thread, and hair.

[0010] Moreover, the goods for cleaning which consist of the conventional plane sheet have the fault that frictional resistance with glass is large and cannot wipe glass easily, when there is \*\*\* in which this sanitary sewage is absorbed and a hand becomes dirty when wiping away the cleaned field where the sanitary sewage adhered and it cleans glass. Although the wet cleaner for glass which infiltrated the liquid cleaning agent into paper or a nonwoven fabric is marketed as goods for glass cleaning, this thing also has the same fault.

[0011] Moreover, when wiping away the cleaned field where the sanitary sewage adhered as a sheet for cleaning, it is required that the sanitary sewage should spread on this cleaned field and the front face of this sheet, and the uptake of dust should not be checked.

[0012] That the purpose of this invention is excellent in the adsorption capacity and maintenance ability of dirt, such as fine dust, therefore, from the first While excelling in uptake ability, such as hair of the cotton dust brought about according to the debt effectiveness of nonwoven fabric fiber with high capture of big dirt, such as bread crumbs using the concave convexity of a nonwoven fabric, and degree of freedom, waste thread, and hair, and flexibility, aesthetic property, etc. being good When it uses as a sheet for cleaning, even if it wipes away the cleaned field where the sanitary sewage adhered Dry type cleaning can be continued, without soiling a hand by the sanitary sewage, with the uptake capacity of dust maintained, and it can work smoothly by glass wiping, and is in offering the loft sheet which can be used for both dry type cleaning and wet cleaning good.

[0013]

[Means for Solving the Problem] The nonwoven fabric-like fiber aggregate with which this invention was formed in one side or both sides of a reticulated sheet by interlacement of fiber is unified in the state of interlacement also to this reticulated sheet with interlacement between the configuration fiber. Much concave heights are formed in the front face of the above-mentioned fiber aggregate, and the above-mentioned purpose is attained by offering the loft sheet characterized by the configuration fiber of the fiber aggregate currently interlaced by at least one side of the above-mentioned reticulated sheet containing hydrophilic fiber.

[0014] In this invention, since irregularity is not substantially formed only by contracting a reticulated sheet, and the fiber aggregate does not carry out contraction substantially and it unites with the reticulated sheet, the concave heights of bigger a large number than a reticulated sheet are formed. In addition, a fiber aggregate puts what configuration fiber is interlacing, and a fiber web puts the thing before interlacing with this invention.

[0015]

[Function] since the fiber which constitutes the nonwoven fabric-like fiber aggregate carries out an upheaval array at the shape of a wave, the degree of freedom of fiber is high, the shape of much toothing is given as the whole sheet and the loft sheet of this invention serves as bulky, when you use as a sheet for cleaning, be involved from small dust to comparatively big dust, such as crumbs etc. and hair of hair, -- uptake of the dust of the large range is carried out certainly. Moreover, since the loft sheet of this invention will absorb water in the part although it will be got wet by the part in contact with the sanitary sewage if the cleaned field where the sanitary sewage adhered during dry type cleaning is wiped away, it can continue good dry type cleaning in the part into which the loft sheet got dry, water's not spreading on a cleaned field and

the front face of a sheet, and maintaining the uptake capacity of dust. Moreover, since the shape of much toothing is given to the eradication side of a base fabric and the loft sheet of this invention serves as bulky, it can work smoothly by glass etc. wiping.

[0016]

[Example] The example of this invention is explained to a detail, referring to an accompanying drawing below. The sectional view showing the condition that drawing 1 piled up the reticulated sheet and fiber web in the early stages of manufacture of a loft sheet of this invention, [ of the 1st example ] The sectional view showing the condition that drawing 2 piled up the reticulated sheet and fiber web in the early stages of manufacture of a loft sheet of this invention, [ of the 2nd example ] The sectional view of an example of the finished product of the loft sheet which shows drawing 3 to drawing 1, the sectional view of an example of the finished product of the loft sheet which shows drawing 4 to drawing 2, The schematic diagram showing the whole manufacturing installation used suitably [ in case drawing 5 manufactures the loft sheet shown in drawing 4 ], The top view of the network with which drawing 6 is used as a reticulated sheet, the top view of a reticulated web where drawing 7 is used as a reticulated sheet, the top view of the perforated film with which drawing 8 is used as a reticulated sheet, and drawing 9 are the top views showing the condition of having attached the sheet for cleaning in the instrument with a shank.

[0017] First, the loft sheet 10 of the 1st example of this invention shown in drawing 3 is explained. The loft sheet 10 of this 1st example on one side of the reticulated sheet 11 (13 14) The fiber aggregate 12 of the shape of a nonwoven fabric formed by interlacement of fiber is unified in the state of interlacement also to this reticulated sheet 11 (13 14) with interlacement between the configuration fiber. And much concave heights 12A and 12B are formed in the front face of the above-mentioned fiber aggregate 12, and it is characterized by the configuration fiber of the above-mentioned fiber aggregate 12 containing hydrophilic fiber.

[0018] The above-mentioned reticulated sheet 11 (13 14) contains the reticulated web 13 which consists of a potential crimp manifestation fiber aggregate in which the network 11 as been a large concept containing the perforated film which has many holes, for example, shown in drawing 6 , and the hole as shown in drawing 7 were formed, and the perforated film 14 which has many holes as shown in drawing 8 .

[0019] Although what was formed in the shape of a grid as a whole is used as the above-mentioned network 11 as the above-mentioned reticulated sheet as shown in drawing 6 As various configurations of the hole formed in the reticulated sheet 11 (13 14) can deform, for example, it is shown in drawing 8 , the configuration of the hole of a perforated film 14 As shown in (a), you may be a star type configuration, as shown in (b), you may be a round shape configuration, and as further shown in (c), a round shape and a star type may be combined.

[0020] Moreover, as the above-mentioned fiber aggregate 12 is shown in drawing 3 , a part for a non-connecting part with the reticulated sheet 11 (13 14) is formed as height 12A, and a part for a joint with the reticulated sheet 11 (13 14) is formed as concave section 12B. And the concave convex which has a product made from a cushion by much height 12A and concave section 12B between these is formed in the above-mentioned fiber aggregate 12.

[0021] The front face of the above-mentioned fiber aggregate 12 is constituted by the fiber which carried out the confounding, and when especially used as a sheet for cleaning, it catches the fine dust which adhered to the cleaned field among these configuration fiber.

[0022] As the above-mentioned hydrophilic fiber contained in the above-mentioned fiber aggregate 12 as the configuration fiber, although regenerated fibers, such as natural fibers, such as pulp and a cotton fiber, and rayon, etc. are desirable, what performed surface treatment by the hydrophilic matter, the thing which introduced the hydrophilic group, and the thing which performed fine porosity fibrosis processing may be suitably used for a hydrophobic synthetic fiber.

[0023] The content of the above-mentioned hydrophilic fiber in the above-mentioned fiber aggregate 12 is 10 – 90 % of the weight especially preferably five to 95% of the weight more preferably one to 99% of the weight. Water absorption effectiveness with the content of the above-mentioned hydrophilic fiber sufficient at less than 1 % of the weight is difficult to get, and

the uptake nature of the hair of hair falls by \*\* 99% of the weight.

[0024] Moreover, in the point that, for example, an adhesive property will be raised if thermoplastic fiber exists when heat treatment of a heat roll etc. performs junction to the reticulated sheet 11 and the fiber aggregate 12, although semi-synthetic fibers, such as compound-ized fiber using the resin of synthetic fibers, such as polyester fiber, a polyamide fiber, a polyolefin fiber, and an acrylic fiber, and each of these fiber as configuration fiber of the above-mentioned fiber aggregates 12 other than the above-mentioned hydrophilic fiber and acetate system fiber, or cotton-mixing is used, it is desirable.

[0025] Although these configuration fiber has the desirable one where a degree of freedom is higher, when it considers as the fiber aggregate 12, in order to prevent a lot of fluff omissions or to raise practical strength, binder fiber etc. may be mixed with cotton, and a part of configuration fiber may be welded or pasted up. moreover, powder bond — \*\*\* for optimum dose — it is also possible to prevent omission of fiber by things. However, it is necessary to take into consideration and set up the prehension nature of fine dust, and the reinforcement of the fiber aggregate 12.

[0026] Moreover, the fineness, the fiber length, the cross-section configuration, the degree of slip, and reinforcement of configuration fiber take workability, cost, etc. into consideration in the basis weight of the above-mentioned fiber aggregate 12, and a list synthetically, and are determined as them in accordance with the purpose of use.

[0027] Moreover, as for the network 11 as the above-mentioned reticulated sheet, it is desirable to use the thing of heat shrink nature, and it can form much concave heights in the front face of the above-mentioned fiber aggregate on the occasion of manufacture of the loft sheet 10 by using the network of this heat shrink nature by the heat shrink by heat treatment of the network of the above-mentioned heat shrink nature. As a network of the above-mentioned heat shrink nature, a polyolefine system, for example, polyethylene, Polyester systems, for example, polyethylene terephthalate, such as polypropylene and polybutene Nylon 66, polyamide systems, for example, nylon 6, such as polybutylene terephthalate, etc., An acrylonitrile system and a vinyl system, and a vinylidene system, for example, a polyvinyl chloride, It is the network which consisted of thermoplastic polymers [ such as those denaturation object, alloys, and such mixture, ], such as a polyvinylidene chloride. What is contracted in one shaft or the biaxial direction according to the shape of tooth of the target loft sheet, Or the filament which carries out a heat shrink by the above-mentioned thermoplastic polymer is used for either [ at least ] warp or the woof, and weaving or the composed network is desirable and it selects suitably according to the shape of tooth of the loft sheet made into the purpose.

[0028] Moreover, what gave puncturing to the film contracted in one shaft or the biaxial direction by the above-mentioned thermoplastic polymer by punching etc. as the above-mentioned perforated film 14 as the above-mentioned reticulated sheet can be used.

[0029] moreover, as the above-mentioned reticulated web 13 as the above-mentioned reticulated sheet A monoolefin polymer and copolymers, such as ethylene, a propylene, and a butene, high density polyethylene, low density polyethylene, and a line — low density polyethylene — Polypropylene, ethylene propylene rubber, an ethylene-vinylacetate copolymer, etc., An ester system polymer and copolymers, such as polyethylene terephthalate and polybutylene terephthalate, Vinyl systems, such as a polyvinyl chloride and a polyvinylidene chloride, a vinylidene system polymer, and a copolymer, Polyamide system polymers, such as nylon 6 and Nylon 66, and a copolymer, an acrylonitrile system polymer, and a copolymer, Or fiber of heat shrink nature which consists of such mixture or potential crimp manifestation fiber which crimp discovers by heating, The fiber web which it consists of mixture of these fiber, and those fiber is mutually unified in the state of interlacement, for example, consists of the above-mentioned configuration fiber or by the high-speed liquid style or airstream The fiber aggregate sheet which made configuration fiber interlace mutually while forming in a reticulated gestalt and which has a reticulated pattern, And the fiber aggregate sheet which carried out drilling by punching etc. is used for the sheet-like object which made the above-mentioned configuration fiber interlace mutually, and made it unify with a specific aperture, a hole pitch, and a hole pattern.

[0030] When using the above-mentioned network 11 as the above-mentioned reticulated sheet, the wire size, a conductor spacing, an aperture, a hole pitch, a hole pattern, etc. Although it needs to be decided in consideration of partial interlacement nature with the above-mentioned fiber aggregate 12 etc. that it will be the configuration and degree list of the concave heights 12A and 12B which are formed of the shrinkage force of a network 11 and contraction of a network 11 usually, a wire size — desirable — 20 micrometers — 500 micrometers further — desirable — 100 micrometers — 200 micrometers \*\* — when it carries out, it is good, and a conductor spacing is desirable, and it is good to be referred to as 4mm — 20mm still more preferably 2mm — 30mm.

[0031] Moreover, when using the above-mentioned reticulated web 13 or the above-mentioned perforated film 14 as the above-mentioned reticulated sheet, those diameters of puncturing are 8mm — 20mm still more preferably 4mm — 40mm preferably, and the clearance during those puncturing is 4mm — 10mm still more preferably 2mm — 20mm preferably. In addition, when using things other than the above as the above-mentioned reticulated sheet, an aperture etc. can be chosen according to the above-mentioned reticulated sheet.

[0032] Next, the loft sheet 10 of the 2nd example of this invention shown in drawing 4 is explained. The loft sheet 10 of this 2nd example is what has arranged the fiber aggregate 12 to both sides of the reticulated sheet 11 (13 14), and except that the fiber aggregate 12 is arranged at both sides of the reticulated sheet 11 (13 14), it has the same composition as the 1st above-mentioned example.

[0033] In the case of the loft sheet with which the fiber aggregate has been arranged to both sides of a reticulated sheet like this 2nd example, as the fiber aggregate of sheet both sides, it may be the same and a different thing may be used. It is possible to consider as the product with which it considers as the product whose proper use is possible by both sides of a sheet according to the purpose of use, or aesthetic property differs by both sides of a sheet by using those from which the class of the things from which the content rate of a different thing as the fiber aggregate of sheet both sides, for example, hydrophilic fiber, differed, or configuration fiber differed.

[0034] The fiber aggregate can be made to carry out support of the drugs at the loft sheet of this invention 0.1 to 500% of the weight (fiber aggregate weight criteria). When using the loft sheet of this invention as a sheet for cleaning especially, it is desirable to make the fiber aggregate support the drugs according to a demand function suitably. A cleaning agent etc. is mentioned [ which shall mainly aim substantial with the oils component aiming at dry dry type cleaning at wet wet cleaning substantially as such drugs ].

[0035] As the above-mentioned oils component, a thing including at least one or more kinds in straight mineral oil, synthetic oil, silicon oil, and a surfactant is desirable. As the above-mentioned straight mineral oil, paraffin hydrocarbon, a naphthene hydrocarbon, aromatic hydrocarbon, etc. are used.

[0036] As the above-mentioned synthetic oil, chain-like dimethylpolysiloxane, annular dimethylpolysiloxane, methyl hydrogen polysiloxane, or various denaturation silicone is used as silicon oil, such as an alkylbenzene oil, a polyolefine oil, and a polyglycol oil.

[0037] The mono-long-chain alkyl trimethylammonium salt in which the above-mentioned surfactant has the alkyl group or alkenyl radical of carbon numbers 10—22 as a cation system, JI long-chain alkyldimethyl ammonium salt, a mono-long-chain alkyl dimethylbenzyl ammonium salt, etc. are mentioned. As a non-ion system Polyoxyethylene (6—35 mols) long-chain alkyl or the alkenyl (1st class or 2nd class C8 — C22) ether, Polyethylene glycol ether molds, such as polyoxyethylene (6—35 mols) alkyl (C8 — C18) phenyl ether, Polyhydric-alcohol molds, such as a polyoxyethylene polyoxypropylene block copolymer or a glycerine fatty acid ester, a sorbitan fatty acid ester, and alkyl glycoside, etc. are mentioned. In addition, in order to wash effectively, as for the above-mentioned surfactant, it is desirable that water is included 5 or less % of the weight.

[0038] The viscosity (25 degrees C) of the above-mentioned oils component is 5—1000cps. It is desirable and is 5—200cps. It is especially desirable. 5cps When few, adsorbent [ of dust ] is bad, and it becomes the cause which damages a cleaning side from 1000cps since an oils component

cannot spread equally that it is size easily on fiber and coefficient of friction with a cleaning side increases. 15 – 45dyn / cm is desirable especially desirable, and surface tension (25 degrees C) is 20 – 35dyn / cm. It is because it will breadth-come equally to be hard on the fiber which constitutes a nonwoven fabric if larger [ when fewer than 15dyn / cm, adsorbent / of dust / is bad, and ] than 45dyn / cm.

[0039] \*\*\*\*\* of the above-mentioned oils component can make dust-collecting ability and \*\*\*\*\* increase by 0.5 – 40% of good better \*\* 0.1 to 80% to the weight of the fiber aggregate by being good to consider as 1 – 20% preferably especially, and making it \*\*\*\* at this rate. It is because a feeling of stickiness to a hand will get worse remarkably if dust collecting and the rise by addition of the oils component of \*\*\*\*\* are not enough if there is less \*\*\*\*\* of an oils component than 0.1%, and it becomes large from 80%. Since the concave height is formed in the front face of the fiber aggregate, even if the loft sheet of this invention makes the fiber aggregate support an oils component, there is little adhesion of the oils component to the hand when touching, and there is few feeling of stickiness.

[0040] Although it is desirable to include at least one or more kinds in straight mineral oil, synthetic oil, silicon oil, and a surfactant as for this oils component as mentioned above, the rate, the viscosity of a class and these oils, surface tension, etc. are suitably decided according to the class of the purpose of cleaning, and configuration fiber of a nonwoven fabric. Moreover, an antimicrobial agent, an antifungal agent, a germicide, etc. can be included in the above-mentioned oils component if needed.

[0041] Moreover, it is desirable that it is a water solution including at least one or more kinds of a surfactant, a solvent, and alkali chemicals as the above-mentioned cleaning agent.

[0042] As the above-mentioned surfactant, various activators, such as a non-ion system, a cation system, an anion system, and a both-sexes system, are mentioned. As the above-mentioned anion system surfactant, the usual sulfonate system anion system surfactant and a sulfate system anion system surfactant are used. As a sulfonate system anion system surface active agent, there are a straight chain or a branching alkyl (C8 – C22) benzenesulfonic acid salt, a long-chain alkyl (C8 – C22) sulfonate, a long-chain olefin (C8 – C22) sulfonate, etc. Moreover, as a sulfate system anion system surfactant, there are a long-chain monoalkyl (C8 – C22) sulfate salt, a polyoxyethylene (1–6 mols) long-chain alkyl (C8 – C22) ethereal sulfate ester salt, a polyoxyethylene (1–6 mols) alkyl (C8 – C18) phenyl ether sulfate salt, etc. The cations as a counter ion of these anion system surfactant are alkanolamine ion, such as alkali-metal ion, such as sodium and a potassium, monoethanolamine, diethanolamine, and triethanolamine, etc. As an anion system surfactant from points, like the resistance to hydrolysis is strong, a sulfonate system surfactant is desirable. Furthermore, the point of a detergency to long-chain or branched chain alkylbenzene sulfonates is desirable. Moreover, as the above-mentioned both-sexes system surface active agent, the carbobetaine which has the alkyl group of carbon numbers 8–22, sulfobetaine, hydroxy sulfobetaine, etc. are mentioned. Moreover, as the above-mentioned non-ion system surfactant and the above-mentioned cation system surfactant, what is contained in the above-mentioned oils component, and the same thing are mentioned. Moreover, as the above-mentioned solvent, glycol ether, such as glycols, such as alcohols, such as ethanol and isopropanol, ethylene glycol, and propylene glycol, ethylene glycol monoethyl ether, and propylene glycol monomethyl ether, is mentioned, and alkanolamines, such as monoethanolamine, etc. are mentioned as the above-mentioned alkali chemicals. Moreover, the above-mentioned cleaning agent can be made to contain components, such as a germicide, a deodorant, and perfume, if needed. The amount of support of these cleaning agents can make the cleaning effect of hand dirt, dirt, etc. increase by 50 to 500% to the weight of the fiber aggregate, when it is good to consider as 100 – 300% preferably and it makes it support with this rate. When there are few amounts of support of a cleaning agent than 50%, there is too little area which can be cleaned, and if it exceeds 500%, the washing active substance which cannot be held in a sheet during cleaning drips and is not desirable.

[0043] Furthermore, the loft sheet of this invention operates and cleans a sheet using a direct hand, when using as a sheet for cleaning, and also it can be attached in an instrument with a shank, and can be used as goods for cleaning. Although especially the gestalt is not limited, the

thing of the mop, the handy mop, and Mr. HATAKI is mentioned, and especially the cleaning section looks at it macroscopically, and it is [ an instrument with a shank ] desirable. [ of a plane thing ] Drawing 9 shows an example of the above-mentioned instrument with a shank, and the sign 40 in drawing is the cleaning section. Thus, by making an instrument with a shank equip with this cleaning sheet, this sheet for cleaning can clean the location which hands, such as clearances, such as furniture, and head lining, cannot reach easily, and the engine performance of this cleaning sheet excellent in holding fine dust and the pan waste which carried out uptake once, the hair of hair, cotton dust, etc. can fully be demonstrated.

[0044] The loft sheet of above-mentioned this invention is manufactured as follows, when a heat shrink nature sheet is used as a reticulated sheet.

[0045] As shown in drawing 1 and drawing 2, after carrying out the laminating of the fiber web 12 to one side or both sides of the reticulated sheet 11 (13 14) which carry out a heat shrink in one shaft or the biaxial direction, The fiber of the fiber web 12 which is in the one side side of the reticulated sheet 11 (13 14) according to a stream, and the fiber of the fiber web 12 which is in a side on the other hand, And each fiber webs 12 and 12 are used as the fiber aggregate of the shape of a nonwoven fabric by interlacement at carrying out the slip coalition of the fiber and the reticulated sheet 11 (13 14) of the fiber web 12, and coincidence. Then, when desiccation, coincidence, or a desiccation process carries out the heat shrink of the reticulated sheet 11 (13 14) of heat shrink nature for the obtained fiber aggregate independently, the shape of a wave is made to carry out the upheaval array of the configuration fiber of the fiber aggregate of the shape of this nonwoven fabric, and the shape of toothing is given as a whole.

[0046] That is, as shown in drawing 5, the fiber web 12 lets out through the delivery equipment 22 continuously from each of the carding machines 21A and 21B which make the fiber web 12. On the other hand, among carding machines 21A and 21B, the roll 23 of the reticulated sheet 11 (13 14) is arranged, and the reticulated sheet 11 (13 14) lets out from the delivery roll 25 of a roll 23.

[0047] And with the above-mentioned delivery roll 22, the fiber web 12 piles up and it is carried in to water needling equipment 26 by the both sides of the reticulated sheet 11 (13 14). Here, fiber aggregate 12 comrades which are made to interlace the fiber of the fiber web 12 with a reticulated sheet, and are in both-sides side of the reticulated sheet 11 (13 14) are made to interlace according to a jet stream, and a sheet as shown in drawing 2 is produced.

[0048] The fiber aggregate 12 and the reticulated sheet 11 (13 14) after interlacement pass along a nip roll 27, are carried in to desiccation and the heating apparatus 28 for carrying out a heat shrink, and are heat-treated. By this heat treatment, the reticulated sheet 11 (13 14) carries out a heat shrink, and as shown in drawing 4 as an example, height 12A and concave section 12B are formed in the fiber aggregate 12 of the shape of a nonwoven fabric interlaced on the reticulated sheet 11 (13 14). At the heating process by heating apparatus 28, it processes by moderate temperature and time amount to what unified the nonwoven fabric-like fiber aggregate 12 and the reticulated sheet 11 (13 14) of heat shrink nature. What is necessary is just to make it become contraction for acquiring the shape of toothing to need, although those conditions change with reticulated sheets 11 (13 14) of heat shrink nature. However, in case the flow direction of this sheet is shrunk in the state of a continuous junction sheet, the speed difference of the entrance side of the heat treatment section and an outlet side becomes the important point. That is, when tensile force is larger than contraction stress, as for the velocity ratio of order, doubling with the thing near contraction to need is desirable.

[0049] When making drugs \*\*\*\* to the fiber aggregate of a loft sheet, although not limited, as shown in drawing 5, especially as the approach, it is given by the spray equipment 31 arranged between the nip roll 29 and the winder 30, for example. Although grant of drugs may be performed before heat treatment or you may carry out after heat treatment, when carrying out before heat treatment, it is desirable to form predryer between a nip roll 27 and heating apparatus 28, and to make drugs \*\*\*\* after desiccation by this equipment. Especially when using a cleaning agent as drugs, it is desirable to carry out after heat treatment.

[0050] When a loft sheet is in a continuation sheet condition, you may roll round in the shape of a roll, it may cut to succeedingly required die length, and you may fold up and pack if needed.

The loft sheet after drugs grant is rolled round by the winder 30 through a nip roll 29.

[0051] In addition, as shown in drawing 1, when the laminating of the fiber web 12 is carried out to one side of the reticulated sheet 11 (13 14), it sets. When a part for a non-connecting part with the reticulated sheet 11 (13 14) is formed as height 12A, Only not only in when height 12A is formed only in one side of the reticulated sheet 11 (13 14) like drawing 3 Height 12A is formed in both sides of the reticulated sheet 11 (13 14) at random. [ as shown in drawing 2, when it is generally also when a concave convex is formed as a whole, and the laminating of the fiber web 12 is similarly carried out to both sides of the reticulated sheet 11 (13 14) ] When the configuration fiber between the fiber aggregates arranged on both sides of the reticulated sheet 11 (13 14) is interlacing also in a part for a non-connecting part with the reticulated sheet 11 (13 14) Height 12A which have come out to both sides of the reticulated sheet 11 (13 14) of drawing 4 will be united, and height 12A will be formed in one field side of these sheets. Height 12A will be formed in both sides of the reticulated sheet 11 (13 14) at random, a concave convex will be formed as a whole, and each of these is contained in the example of this invention.

[0052] Moreover, since the fiber aggregates which exist in a front rear face through a hole interlace strongly and it is hard to interlace the fiber on a film or a grid with a puncturing film or a network when using the film which has puncturing as a reticulated sheet, and when using the thick or small network of puncturing of a wire size, when the fiber on a film or a grid upheaves contrary to the above-mentioned case, the shape of toothed is formed. In carrying out the laminating of the fiber aggregate to the both sides and making them interlace it especially, using a network as a reticulated sheet, in order for the fiber of the fiber aggregate to interlace strongly on both sides of the hole of a network, it is easy to form a crevice.

[0053] Furthermore, the loft sheet of this invention is explained based on a concrete example. 1.5 deniers of polyester fiber, (Operation article 1: What has arranged the same fiber aggregate to both sides of a reticulated sheet) 51mm and 1.5 deniers of rayon fibers, and the thing that mixed with cotton 51mm at a weight rate of polyester fiber / rayon fiber =3/7 are used. It is basis-weight 10 g/m<sup>2</sup> with the card of a conventional method. Form a fiber web and the fiber web is wrapped at three layers (30 g/m<sup>2</sup>) (not shown). After carrying out the network (five mesh / 0.2mm of wire sizes) in which polypropylene carries out biaxial contraction as a reticulated sheet to the middle class and carrying out the laminating of this fiber web to a vertical layer, it was made to interlace by water needling. Water needling is water pressure [ of 40kg/cm<sup>2</sup> ], and nozzle pitch 1.6mm, and rate 5 m/min in that case. It carried out. Then, after making desiccation and coincidence contract a network by heat-treating for 50 seconds by 130-degree C hot blast, The oil component which consists of 95% of liquid paraffins, and nonionic surfactant [polyoxyethylene (3.3 average addition mols) alkyl (C12-C13) ether] 5% with a spray (the viscosity of 125cps) Surface tension 30dyn / cm was given at 5% of a rate to fiber weight, and the operation article 1 which has irregularity on the front face whose area contraction is 20% was obtained.

[0054] In addition, area contraction is computed by the following type (1).

[0055]

[Equation 1]

Area contraction (%) =100-AxBx100 (1)

However, A and the B are as follows.

A=(die length of one side after heat shrink of lengthwise direction)/(die length of one side before the heat shrink of a lengthwise direction)

B=(die length of one side after lateral heat shrink)/(die length of one side before a lateral heat shrink)

[0056] (Comparison article 1: That in which the fiber aggregate does not contain hydrophilic fiber) As a raw material of the fiber web which constitutes a fiber aggregate, the comparison article 1 was obtained like the case of the operation article 1 except having used only 1.5 deniers of polyester fiber, and 51mm.

[0057] The following evaluations were performed about each of the operation article 1 mentioned above and the comparison article 1. The result is shown in the following table 1. In addition, the magnitude of the sample at the time of evaluating was prepared to 7x11cm.

[0058] 1. Dust Amount of Adsorption (Dust Uptake Ability)

Seven sorts (JIS Z8901) of dusts and aerosols for industrial testing near the presentation of soil and dust were wound around 1g homogeneity at the 30x30cm size, the sample was stuck on sponge with a magnitude of 7x11cm, it fixed and the amount of the dust which went ten times and stuck to the sample was measured.

[0059] 2. One cc waterdrop was dropped on the wiping nature glass side of water, and viewing estimated the remaining condition of water after wiping it off with a sample.

The criterion of visual evaluation is as follows.

O : water hardly remains on the glass side.

x: Water spreads and remains on the glass side.

[0060]

[Table 1]

	ダスト吸着量 (g)	水の拭きとり性
実施品1	0.86	○
比較品1	0.85	×

[0061] 2 deniers of polyester fiber, (Operation article 2: What has arranged the fiber aggregate on one side of a reticulated sheet) 51mm, 3 deniers of rayon fibers, 51mm, and 3 deniers of sheath-core fiber of polypropylene/polyethylene, What mixed with cotton 51mm at a weight rate of polyester fiber / rayon fiber / sheath-core fiber =2/6/2 is used. It is basis-weight 10 g/m<sup>2</sup> with the card of a conventional method. Form a fiber web and the fiber web is wrapped at five layers (50 g/m<sup>2</sup>) (not shown). After carrying out the network (five mesh / 0.2mm of wire sizes) in which polypropylene carries out biaxial contraction as a reticulated sheet to the lower layer and carrying out the laminating of this fiber web to the upper layer, it was made to interlace by water needling. Water needling is water pressure [ of 40kg/cm<sup>2</sup> ], and nozzle pitch 1.6mm, and rate 5 m/min in that case. It carried out. Then, by heat-treating, desiccation and coincidence were made to contract a network and the sheet for cleaning which has irregularity on the front face whose area contraction is 25% was obtained.

[0062] The drugs which consist of a water solution which contains ethanol 3% and polyethylene-glycol monomethyl ether 2% in this sheet for cleaning like the case of the operation article 1 nonionic surfactant [polyoxyethylene (seven average addition mols) alkyl (C12-C13) ether] 0.1% were given at 200% of a rate to fiber weight (weight of the fiber aggregate), and the operation article 2 was obtained.

[0063] (Operation article 3: What has arranged the fiber aggregate on one side of a reticulated sheet) The operation article 3 was obtained like the case of the operation article 2 except having shrunk the network so that area contraction might become 10%.

[0064] (Comparison article 2: Plane goods for cleaning) 1.5 deniers of polyester fiber and 51mm are used, and it is basis-weight 10 g/m<sup>2</sup> with the card of a conventional method. A fiber web is formed, seven layers (70 g/m<sup>2</sup>) were wrapped and the fiber web was made to interlace by water needling. Water needling is water pressure [ of 40kg/cm<sup>2</sup> ], and nozzle pitch 1.6mm, and rate 5 m/min in that case. It carried out. Then, the spray gave the same drugs as the operation article 2 at this rate, and the plane comparison (there is no irregularity in front face) article 2 was obtained.

[0065] The following evaluations were performed in the operation article 2 and 3 lists which were mentioned above about each of the comparison article 2. The result is shown in the following table 2. In addition, the magnitude of the sample at the time of evaluating was prepared to 7x11cm.

[0066] The following criteria estimated the ease of wiping at the time of carrying out the toilet of

the glass side top with a sample in the ease of wiping on glass.

O : the toilet can be performed comfortably, without a hand and a sample separating at the time of the toilet.

x: A sample may separate from a hand at the time of the toilet.

[0067]

[Table 2]

	面積収縮率 (%)	ガラス上の拭き易さ
実施品2	25	○
実施品3	10	○
比較品2	0	×

[0068] (Operation article 4: What has arranged the fiber aggregate to both sides of a reticulated sheet) Made into the middle class the same reticulated sheet as what was used in the operation article 1, made 1.5 deniers of polyester fiber, and a 51mm fiber web the upper layer, made the laminating of 1.5 deniers of rayon fibers, and the 51mm fiber web to the lower layer, it was made to interlace by water needling, and the operation article 4 which has about 15% of area contraction was obtained.

[0069] (Comparison article 3: That in which the fiber aggregate does not contain hydrophilic fiber) As a fiber web of a vertical layer, the comparison article 3 was obtained like the case of the operation article 4 except having used only 1.5 deniers of polyester fiber, and a 51mm fiber web.

[0070] (Comparison article 4: What a fiber aggregate becomes only from hydrophilic fiber) As a fiber web of a vertical layer, the comparison article 4 was obtained like the case of the operation article 4 except having used only 1.5 deniers of rayon fibers, and a 51mm fiber web.

[0071] The following evaluations were performed in the operation article 4 list mentioned above about each of the comparison article 3 and 4. The result is shown in the following table 3. In addition, the magnitude of the sample at the time of evaluating was prepared to 7x11cm.

[0072] 1. About 10cm of hair uptake nature human head hair of hair was sprinkled so that ten might not lap densely, 3 \*\*\*\*s of the things which stuck each above-mentioned operation article and a comparison article on sponge with a magnitude of 7x11cm, and were fixed to it were carried out on it, and organic-functions evaluation was performed about the difficulty of dropping in the ease of the ability to take of the hair of hair.

[0073] The criterion of organic-functions evaluation is as follows.

O : it is hard to drop the hair of the hair which took 10-8 hairs certainly, and took them.

O : although 10-8 hairs are taken certainly, what was taken may fall.

\*\*: Although 7-5 hairs are taken, it is easy to drop the hair of the taken hair.

x: Don't take five or more hairs.

[0074] 2. It evaluated like the case in the wiping nature above-mentioned implementation article 1 of water.

[0075]

[Table 3]

	髪の毛捕集性	水の拭きとり性
実施品4	○	○
比較品3	○	×
比較品4	△	○

[0076] The operation article which is the goods for cleaning of this invention is excellent in dust uptake ability and the wiping nature of water, and can work smoothly by glass wiping so that clearly from Tables 1–3. On the other hand, the comparison article 1 and 3 of the wiping nature of water is bad, and the comparison article 2 cannot work smoothly by glass wiping, and the comparison article 4 is inferior in the hair uptake nature of hair.

[0077] In addition, the loft sheet of this invention is not restricted to an above-mentioned example, and the application is not restricted to the sheet for cleaning, either, and it can be applied to facing or a cushioning material in toilet material and sanitary goods etc., and the drugs supported if needed are also suitably chosen according to an application.

[0078]

[Effect of the Invention] That the loft sheet of this invention is excellent in the adsorption capacity and maintenance ability of dirt, such as fine dust, from the first While excelling in uptake ability, such as hair of the cotton dust brought about according to the debt effectiveness of nonwoven fabric fiber with high capture of big dirt, such as bread crumbs using the concave convexity of a nonwoven fabric, and degree of freedom, waste thread, and hair, and flexibility, aesthetic property, etc. being good When it uses as a sheet for cleaning, even if it wipes away the cleaned field where the sanitary sewage adhered Dry type cleaning can be continued, without soiling a hand by the sanitary sewage, with the uptake capacity of dust maintained, and it can work smoothly by the ability of glass wiping, and can use for both dry type cleaning and wet cleaning good.

[Translation done.]

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**DESCRIPTION OF DRAWINGS**

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**[Brief Description of the Drawings]**

[Drawing 1] Drawing 1 is the sectional view showing the condition of having piled up the reticulated sheet and fiber web in the early stages of manufacture of a loft sheet of this invention. [ of the 1st example ]

[Drawing 2] Drawing 2 is the sectional view showing the condition of having piled up the reticulated sheet and fiber web in the early stages of manufacture of a loft sheet of this invention. [ of the 2nd example ]

[Drawing 3] Drawing 3 is the sectional view of an example of the finished product of the loft sheet shown in drawing 1.

[Drawing 4] Drawing 4 is the sectional view of an example of the finished product of the loft sheet shown in drawing 2.

[Drawing 5] In case drawing 5 manufactures the loft sheet shown in drawing 4, it is the schematic diagram showing the whole manufacturing installation used suitably.

[Drawing 6] Drawing 6 is the top view of the network used as a reticulated sheet.

[Drawing 7] Drawing 7 is a top view of a reticulated web used as a reticulated sheet.

[Drawing 8] Drawing 8 is the top view of the perforated film used as a reticulated sheet.

[Drawing 9] Drawing 9 is the top view showing the condition of having attached the sheet for cleaning in the instrument with a shank.

**[Description of Notations]**

10 Loft Sheet

11 (13 14) Reticulated sheet

12 Fiber Aggregate (or Fiber Web)

12A Height

12B Concave section

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**[Translation done.]**

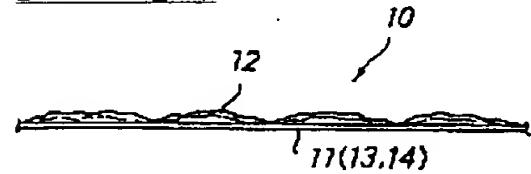
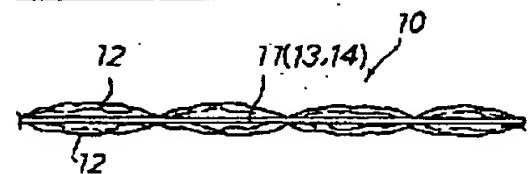
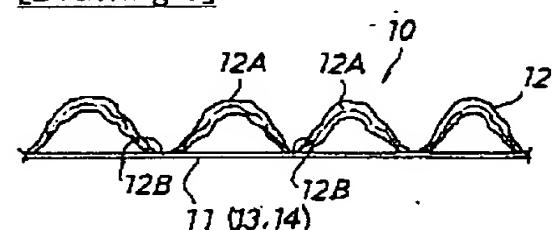
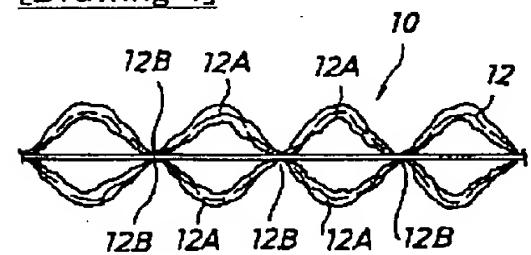
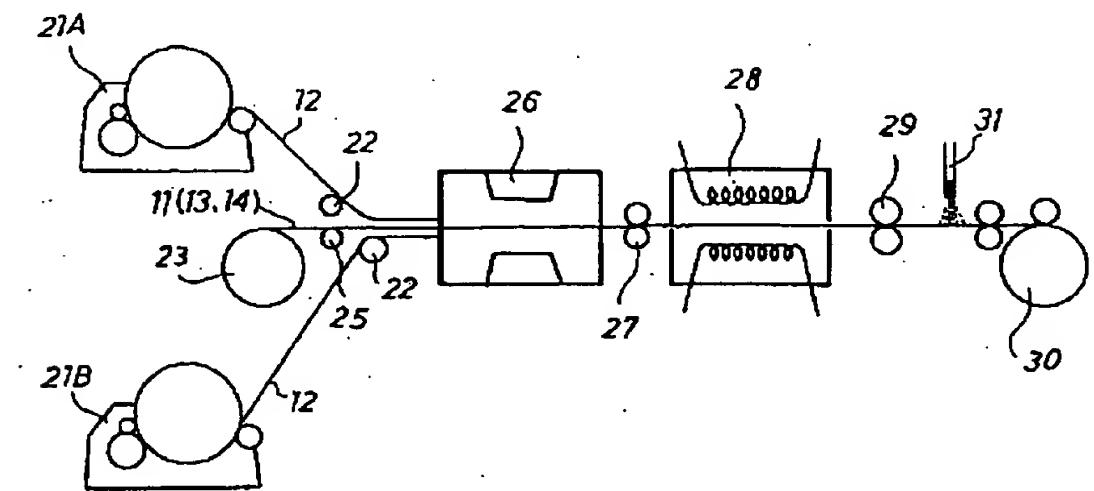
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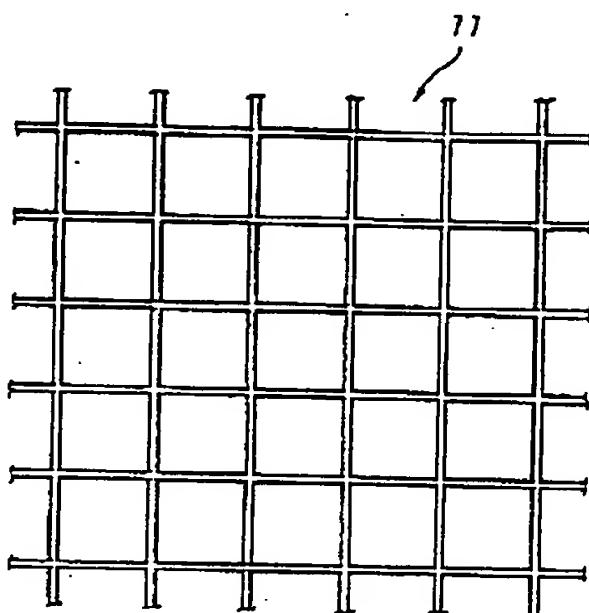
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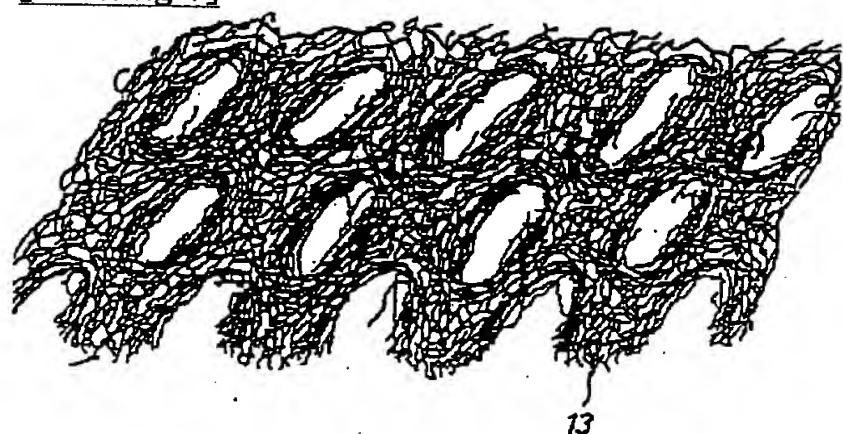
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## DRAWINGS

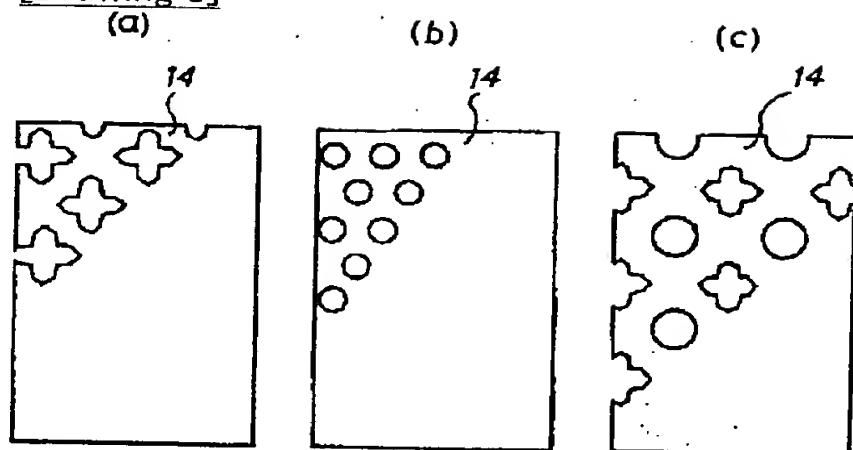
[Drawing 1][Drawing 2][Drawing 3][Drawing 4][Drawing 5][Drawing 6]



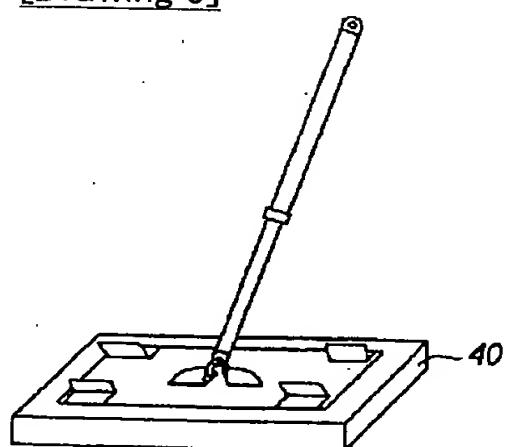
[Drawing 7]



[Drawing 8]



[Drawing 9]



[Translation done.]